

Amendment to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-17 (Previously Canceled)

Claim 18 (Currently Amended): A node device which is used in an optical network system for transferring a user packet input from outside said optical network system to outside said optical network system through a plurality of said node devices, which are provided for making an optical path on a transfer route and which functioning as a start point node device, and an end point node device, an intermediate point node having an optical path to be set in said optical network system device between the start and end point node devices, respectively, the node device comprising:

a router,

an optical switch, and

a node control device, said node control device including a connection information responding means, and an optical path setting means;

said connection information responding means, when said optical network system has sequentially provided therein a first node device, a second node device, a third node device, and a fourth node device and when said connection information responding means belongs to said second node device:

inquiring said third node device adjacent to said second node device about connection information of said third node device and connection information of said fourth node device adjacent to said third node device each time a predetermined time is elapsed or a predetermined event is generated, and storing the connection information of said third node device and the connection information of said fourth node device; and

responding with connection information of said second node device and connection information of said first node device adjacent to said second node device if said second node device receives inquiring about the connection information thereof and the connection information of said first node device; and

said optical path setting means, when said second node device functions as said intermediate node device, setting an optical path in said second node device without going through the router included therein based on the connection information of each of said third and fourth node devices acquired using said connection information responding means.

Claim 19 (Previously Amended): The node device according to Claim 18, further comprising:

an optical path determination means for determining the necessity of a cut-through in said optical path setting means;

said optical path determination means, when said second node device functions as said start point node device and when said first, third, and fourth node devices function as said intermediate node devices, respectively:

determining the necessity of the setting of an optical path which does not go through the router belonging to any one of said first, third, and fourth node devices based on the

connection information of each of said first, third, and fourth node devices, stored by said connection information responding means of said second node device, and

instructing the setting of said optical path to any one of said intermediate node devices which correspond to said first, third, and fourth node devices, respectively, and for which the setting of said optical path is determined as necessary.

Claim 20 (Previously Amended): The node device according to Claim 18, further comprising:

an information channel insuring means for determining whether any one of said intermediate node devices which correspond to said first, third, and fourth node devices, respectively, and for which the setting of said optical path is required, can insure the information channel even after the setting of said optical path, and setting said optical path only when said information channel can be insured.

Claim 21 (Previously Amended): The node device according to Claim 18, further comprising:

an optical cross-connect having provided therein said optical switches for extracting optical signals from an optical fiber, inserting optical signals into an optical fiber, and setting optical paths between input/output optical fibers;

said router receiving a user packet and determining an output destination of said user packet based on header information of upper layer of said user packet; and

said node control device switching a route of the optical paths using the optical switches of said optical cross-connect according to instructions of the received user packet or based on self judgment by said node control device itself.

Claim 22 (Previously Amended): The node device according to Claim 21, wherein said optical switch connects a destination-based buffer to at least one output port of the router to said optical cross-connect, and for connecting a user packet read from said destination based buffer to an input port of said optical cross-connect.

Claim 23 (Previously Amended): The node device according to Claim 22, wherein said router includes an allowable delay recognition function means for determining the allowable delay of a user packet for direct output of said user packet to one of the optical cross-connect and destination-based buffer according to one of the allowable delay and a packet loss ratio.

Claim 24 (Previously Amended): The node device according to Claim 21, further comprising:
an optical path extraction/insertion means provided in said optical cross-connect for an information channel for alternatively extracting optical signals with a fixed wavelength insured for the information channel from the optical fiber, or for inserting said optical signals with a fixed wavelength into the optical fiber for communicating information signals with another node device.

Claim 25 (Previously Amended): The node device according to Claim 21, further comprising:
a pilot tone signal super-imposing/receiving means for one of super-imposing pilot tone signals for an information channel on an optical path for user data, and separating pilot tone signals for the information channel from the optical path for communicating information signals

with another node device.

Claim 26 (Previously Cancelled)

Claim 27 (Previously Cancelled)

Claim 28 (Currently Amended): An optical path setting method for an optical network system for transferring a user packet input from outside said optical network system to outside said optical network system through a plurality of node devices, which are sequentially provided for making an optical path on a transfer route and which function as a start point node device, an end point node device, an intermediate point node device between the start point node and the end point node devices, respectively, each of said node devices comprising a router, an optical switch, and a node control device, and said node control device including a connection information responding means, and an optical path setting means, the method comprising the steps of:

when said optical network system has sequentially provided therein a first node device, a second node device, a third node device, and a fourth node device and when said connection information responding means belongs to said second node device,

said connection information responding means, when said node device functions as said second device,

inquiring said third node device adjacent to said second node device about connection information of said third node device and connection information of said fourth node device adjacent to said third node device each time a predetermined time is elapsed or a

predetermined event is generated, and storing the connection information of said third node device and the connection information of said fourth node device, and

responding with connection information of said second node device and connection information of said first node device adjacent to said second node device if said second node device receives ~~inquire~~ inquiring inquiries about the connection information thereof and the connection information of said first node device; and

said optical path setting means, when said second node device functions as said intermediate node device, setting an optical path in said second node device without going through the router included therein based on the connection information of each of said third and fourth node devices acquired using said connection information responding means.

Claim 29 (Currently Amended): The optical path setting method according to Claim 28, ~~further~~ wherein said node control device further comprises an information channel insuring means, the method comprising the steps of:

said information channel insuring means:

determining whether any one of said intermediate node devices which correspond to said first, third and fourth node devices, respectively and for which the setting of the optical path is requested can insure the information channel even after the setting of the optical path, and

setting said optical path only when said information channel can be insured.

Claim 30. (Currently Amended): The optical path setting method according to Claim 28, further comprising the steps of:

reading a packet from the destination-based buffer provided between said router and said optical switch; and

transmitting the packet to the optical path ~~after setting~~ set by said optical path setting means.

Claim 31 (Previously Amended): The optical path setting method according to Claim 30, further comprising the step of:

storing the packets in said destination-based buffer based on one of an allowable delay time and a packet loss ratio.

Claim 32 (Previously Amended): The optical path setting method according to Claim 28, further comprising the steps of:

communicating between the node devices where the optical path is set; and

using optical signals with a wavelength insured for an information channel after said optical path is set.

Claim 33 (Previously Amended): The optical path setting method according to Claim 32, further comprising the steps of:

communicating between the node devices where the optical path is set; and

super-imposing pilot tone signals for an information channel on the optical path for user data even if said optical path is set.

Claim 34 (Previously Cancelled).

Claim 35 (Currently Amended): A node device in an optical network system including a first node device, a second node device connected thereto through an optical fiber, and a third node device connected thereto through an optical fiber, the node device functioning as said second node device transferring a user packet input from outside said optical network system to said third node device through said second node device, ~~the node device functioning as said second node device~~ each of said node devices comprising:

a router, an optical switch, and a node control device;

said node control device including a connection information responding means, and an optical path setting means,

said connection information responding means inquiring of said third node device adjacent to said second node device about connection information of said third node device and connection information of another node device adjacent to said third node device each time a predetermined time is elapsed or a predetermined event is generated, and storing the connection information of said third node device and the connection information of said another node device as a network connection information; and

said optical path setting means setting an optical path from said first node device to said third node device through said second node device without going through the router included therein based on said network connection information acquired using said connection information responding means.